PROJECT PROPOSAL

**ABSTRACT**

The research topic I choose to write annotated bibliography is SAS programming language. I decide to do this study because I noticed during job searching that many analyst jobs require strong knowledge of statistical analysis software application such as SAS, which is also widely used in the finance industry such as banking and insurance. This makes SAS programming skill an important skill to learn extensively. The research questions that I am going to answer in my project can mainly be concluded by two questions, “What SAS is” and “Why it matters”. To answer the question “What SAS is”, I will explain the basic of SAS coding, for example its basic syntax, DATA step processing, working with variables and observations, and shortcuts in programming. Then I will draw the connection between SAS and R, and further demonstrate the importance of learning SAS programming by showing how SAS skill is used in Big Data analytics, machine learning, and data visualization.

The topic is relevant to this class since as a beginner of computer programming, I believe that many people have the same question as I do, that is what are some useful programming languages to learn or begin with. However, the blogs on the Internet cannot fully explain or fulfill my curiosity about the similarities and differences among SAS, R and Python. I have read both positive and negative reviews on those different programming languages, but the most effective way to understand them is to research a topic deeply enough to satisfy one’s own need. Thus, I expect the audience of the annotated bibliography to find answers about some of the questions they may have on SAS programming.

**DELIVERABLES**

1. Book: *SAS Programming And Data Visualization Techniques: A Power User’s Guide* by Philip R. Holland. (August, 2015)
2. Book: *Step-By-Step Programming With Base SAS® Software*. Cary, NC: SAS Institute Inc. (2001)
3. Article: Big Data Analytics: What it is and why it matter. SAS <http://www.sas.com/en_us/insights/analytics/big-data-analytics.html>
4. Article: Machine Learning: What it is and why it matter. SAS

<http://www.sas.com/en_us/insights/analytics/machine-learning.html>

1. Article: Analytics: What it is and why it matter. SAS

<http://www.sas.com/en_us/insights/analytics/what-is-analytics.html>

1. Article: Data Visualization: What it is and why it matters. SAS

<http://www.sas.com/en_us/insights/big-data/data-visualization.html>

1. Book: *SAS Programming For Enterprise Guide Users.* Cary, NC: SAS Institute Inc. (2010)
2. Book: *Applied statistics and the SAS programming language 5th ed.* by Ronald P. Cody and Jeffrey K. Smith. (2006)
3. Article: *SAS Programming Basics*

<http://www.ats.ucla.edu/stat/sas/seminars/sas_programming_basics/SAS%20Programming%20Basics.htm>

1. Book: *Cody’s collection of popular SAS programming tasks and how to tackle them*. By Ronald P. Cody. (2012)
2. Article: *Estimating Multilevel Models Using SPSS, Stat, SAS, And R*. By Jeremy J. Albright and Dani M. Marinova. (July, 2010)
3. Book: *Applied Data Mining for Forecasting Using SAS(R)*. By Tim Rey , Arthur Kordon, Chip Wells. SAS Institute (2012)
4. Book: Kleinman, Ken, and Nicholas J. Horton. *SAS and R: Data management, statistical analysis, and graphics*. CRC Press, 2014.
5. Article: Brookstein, Ellen, Allan Glaser, and Laurie Koch. *"Getting that New SAS® Programming Job-A Management Perspective."*
6. Book: Elliott, Alan C., and Wayne A. Woodward. *"SAS Essentials: Mastering SAS for Data Analytics."* (2015).
7. Article: Long, S. B., Mueller, H. B., & Gentleman, J. F. (1986). P*rogramming SAS for casual Analysis*. American Statistician, 40(3), 233.
8. Book: Spencer, Neil Hardy. (2004). *SAS programming: the one-day course.* Boca Raton : Chapman & Hall/CRC.
9. Book: Padgett, Lakshmi V. (2011) *Practical statistical methodsa SAS programming approach* Boca Raton, FL : CRC Press.
10. Book: Shostak, Jack. (2014) *SAS programming in the pharmaceutical industry*. Cary, NC: SAS Institute Inc.
11. Book: Ottesen, Rebecca A.,, Delwiche, Lora D.,Slaughter, Susan J.. (2015) *Exercises and projects for the little SAS book*. Cary, NC: SAS Institute Inc.

**PROCESS**

1. Narrow down the main topic SAS programming language to five to six subtopics for further research purposes.
2. Once subtopics are determined, search relevant articles, books, or other resources that can better explain the topic.
3. Read table contents and abstract of books to select chapters that is most relevant to the chosen subtopics.
4. In the process of researching, try SAS programming language using SAS software.
5. Filter sources. Arrange the order of subtopics to read and write about, 4 books or articles per week.

The guideline for writing an annotated bibliography:

* Author (Ex. Is the author qualified to write the article?)
* Purpose (What is the purpose for writing the article or doing the research?)
* Intended Audience
* Author Bias
* Information Source
* Author Conclusion
* Justification
* Relationship to other works

1. Go to writer’s workshop to check grammar and the quality of my work.

**CHALLENGES**

1. SAS is a programming language new to me. So it may takes a lot of time for me research this new topic.
2. Most of the sources on SAS programming is about SAS syntax, but there are not many literatures on statistics of how SAS skill is used in companies and required in job qualification.
3. SAS software is not free, so I may need to purchase one or use ones on campus computer.
4. Most of the books are really long to read, so I have to select the sections that are most relevant to the topic.
5. Before research this topic, I thought SAS is a certificate, an exam like CFA. I think most people know SAS by the SAS Certification, but know less about SAS programming language.

Lamott, Anne. *Bird by Bird: Some Instructions on Writing and Life*. Anchor Books, 1995.

Lamott's book offers honest advice on the nature of a writing life, complete with its insecurities and failures. Taking a humorous approach to the realities of being a writer, the chapters in Lamott's book are wry and anecdotal and offer advice on everything from plot development to jealousy, from perfectionism to struggling with one's own internal critic. In the process, Lamott includes writing exercises designed to be both productive and fun.

Lamott offers sane advice for those struggling with the anxieties of writing, but her main project seems to be offering the reader a reality check regarding writing, publishing, and struggling with one's own imperfect humanity in the process. Rather than a practical handbook to producing and/or publishing, this text is indispensable because of its honest perspective, its down-to-earth humor, and its encouraging approach.

Chapters in this text could easily be included in the curriculum for a writing class. Several of the chapters in Part 1 address the writing process and would serve to generate discussion on students' own drafting and revising processes. Some of the writing exercises would also be appropriate for generating classroom writing exercises. Students should find Lamott's style both engaging and enjoyable.

Ehrenreich, B. (2001). *Nickel and dimed: On (not) getting by in America*. New York: Henry Holt and Company.

In this book of nonfiction based on the journalist's experiential research, Ehrenreich attempts to ascertain whether it is currently possible for an individual to live on a minimum-wage in America. Taking jobs as a waitress, a maid in a cleaning service, and a Walmart sales employee, the author summarizes and reflects on her work, her relationships with fellow workers, and her financial struggles in each situation.

An experienced journalist, Ehrenreich is aware of the limitations of her experiment and the ethical implications of her experiential research tactics and reflects on these issues in the text. The author is forthcoming about her methods and supplements her experiences with scholarly research on her places of employment, the economy, and the rising cost of living in America. Ehrenreich’s project is timely, descriptive, and well-researched.

Davidson, Hilda Ellis. *Roles of the Northern Goddess*. London: Routledge, 1998.

Davidson's book provides a thorough examination of the major roles filled by the numerous pagan goddesses of Northern Europe in everyday life, including their roles in hunting, agriculture, domestic arts like weaving, the household, and death. The author discusses relevant archaeological evidence, patterns of symbol and ritual, and previous research. The book includes a number of black and white photographs of relevant artifacts.